TMF

August 1989

THE MAC FLYER - For Greater Safety in MAC Air Operations

AIRLIFT '89 RODEO
POPE AFB

General Cassidy presents Foulois Award...page 31

TMF

THE MAC FLYER—For Greater Safety in MAC Air Operations

August 1989 MACSP 127-5 VOL XXXVI NO. 8

page 8

page 16

FEATURES

3 **A Formula To Live With**
A previous article generates new thoughts.

4 **No Man's Land . . . and the Max Effort Takeoff**
Always be ready for the unexpected.

8 **Which Way Is Up?**
Not always easy to tell.

11 **The Less We See The Longer We Look**
Watch out for poor quality visual information.

16 **Airlift Rodeo 1989**
And the winners are . . .

21 **The Score**
Mishap investigator . . . a difficult experience.

25 **The Best Man Stayed Home**
TMF anniversary reprint.

DEPARTMENTS

13 **Flying-Hour Milestones**
15 **Excellence In Airmanship**
29 **Quickstoppers**
31 **After Deadlines**

Gen. Duane H. Cassidy — Commander in Chief
Brig. Gen. James L. Cole, Jr. (Sel) — Inspector General
Col. Thomas M. James — Director of Safety

Lt. Col. Richard L. Buck — Supervising Editor
Maj. Dale E. Van De Ven — Associate Editor
Maj. Stephen E. Behr — Associate Editor
Mrs. Frances A. Caldwell — Writer/Editor
Mr. Tommy F. O'Laughlin — Art Director

The *MAC Flyer* is published by the Director of Safety, Military Airlift Command. The contents are informative and not regulatory or directive. Names of people and places in mishap stories are representative and not necessarily of the aircraft or equipment involved. Information in any article may not be construed as incriminating under Article 31, UCMJ.

Contributions, comments, and criticisms are welcomed. Write: *The MAC Flyer*, HQ MAC/IGFE, Scott AFB, IL 62225-5101. Or call Autovon: 576-3534/5542 or commercial: (618) 256-3534/5542. The editors reserve the right to make editorial changes in manuscripts which they believe will improve the material without altering the author's intended meaning.

Subscriptions are available from: The Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Changes of address for subscription mailing should be sent to the GPO. Give both old and new address, including zip codes. USAF Active and Air Reserve Forces units should establish magazine requirements through the OPR (HQ MAC/IGFE). Other U. S. Military units should consult administrative directives. *The MAC Flyer* is published at an approximate ratio of one magazine for every five MAC crewmembers, and one for every twenty MAC support personnel. Distribution: X; OPR: HQ MAC/IGFE ISSN 0634-788X

A Formula To Live With

By Maj. Michael A. Harrison
21 AF/DOXL, McGuire AFB, New Jersey

(Editor's Comments: Once in a while an article published in TMF generates comments from our readers. "Words of Wisdom," TMF March 89, did just that. Here are the thoughts of one such reader, who not only enjoyed the story but was moved to reflect and expand on its message.)

I read "Words of Wisdom," *TMF* March 1989, with great interest. In fact, I read it several times. My congratulations to Mr. Zazas for a hard hitting, well-written article. As good as I thought it was, I'd like to expand on it a little. Mr. Zazas is entirely correct when he said that it took "an attitude to do their job safely." All the safety briefings/meetings in the world won't help if people in the trenches don't have the desire—the *ATTITUDE*—to perform their jobs with safety in mind. I woul like to add one word to Mr. Zazas' article. It's always been my pet word concerning safety, and I've used it liberally over the years both as a squadron safety officer and crewmember. The magic word is *DISCIPLINE.*

Why do we stop at a red light at 0300 hrs after a long flight and a longer debriefing? There's no traffic coming from either direction, yet we wait for the light to turn green before proceeding through the intersection. Home, family, real food, a comfortable bed, all waiting on the other side of that light. So why not run it? Fear of getting a ticket? Not a chance! No police in sight. So why are we waiting? *DISCIPLINE!* We've disciplined ourselves to stop at a red light. Running a red light can be very hazardous, so we stop. It's the safe thing to do. We know that if we let our guard down at night and start running red lights because it's convenient, it could result in a subconscious slip during heavy traffic. *DISCIPLINE!*

Why do we automatically put our seat belts on when we get in a car? Habit? Maybe, but I prefer to call it discipline. We never know when an accident will happen. Statistics point out most fatal accidents occur within 25 miles of home and at speeds under 30 mph. With that unknown factor in mind, we discipline ourselves to buckle up for all trips regardless of length or speed. It's the safe thing to do. *DISCIPLINE!*

Why do we run checklists on such mundane repetitive tasks as "After takeoff touch and go" or "Engine shutdown?" Haven't we done those things a million times? Gear up, flaps up, we could do it by memory. So why do we still open the checklist? We have disciplined ourselves through many years of training to refer to checklists during all phases of flight. Checklists were developed by experts and have changed with lessons learned over the years. We know that running checklists is the safe and smart thing to do, therefore we discipline ourselves to run them regardless how repetitive. *DISCIPLINE!*

Why does the life support technician have his T.O. open while inspecting an oxygen mask? Hasn't he done it a million times? Couldn't he do it with his eyes closed? Probably, but he knows he holds your life in his hands during that inspection, and he's been disciplined to refer to the proper T.O. during all phases of his job. *DISCIPLINE!*

I could probably go on and on, but I think you get the idea. Safety, real safety, takes the proper attitude plus the discipline to put known safety practices to use at all times. If we have the right *ATTITUDE + DISCIPLINE* we will never be an "accident waiting for a place to happen."

Did you notice I kept saying "We?" That's because we're all links in a chain, and the "safety chain" can be no stronger than its weakest link. We must all endeavor to not only practice real safety ourselves, but be quick to point out unsafe acts to others. So I close by saying that *SAFETY = ATTITUDE + DISCIPLINE.* Now that's a formula we can live with.

No Man's Land . . . and the Max Effort Takeoff

By Maj. Douglas W. Houpt & MSgt. John R. Latham
17 TAS, Elmendorf AFB, Alaska

"Shut up, you stupid dog. There's someone at the front door."

"Who's knocking on our door at five-thirty in the morning?"

"I don't know, but it better be important!"

I slipped out of my nice warm bed and stumbled to the front door.

"Are you Major Fearless?"

I could barely make out his face, but the porch light reflecting off his badge told me he was probably someone important.

"Yes, I'm Doug Fearless."

"I'm Sergeant Babcock of the Anchorage Police Department. There's some kind of emergency at the air base and you are supposed to report to work."

"Thanks, Sergeant. See ya later."

As I climbed back upstairs, I knew what had happened. My wife asked, "Well, who was it?"

"It was the police," I answered.

"The police! What did they want?"

"They just alerted me for my flight."

"Do you want any breakfast?" she asked.

"No," I answered, "just go back to sleep. You'll have to get up with Missy in an hour, so get some rest. After she goes to school, you can go back to sleep and enjoy your day off."

I knew I'd better call the squadron and let them know their backup plan had worked.

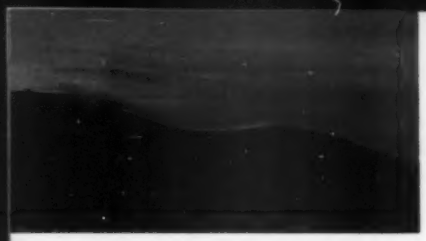
"Good morning. Arctic Airlift Squadron."

"Good morning, Sergeant Cheerful. This is Major Fearless. I'm alerted. I know I'll be late, tell the AC I'll be there as soon as I can."

My mind, now functioning a little faster than before, deduced that if I quickly showered and shaved I would only be 15 or 20 minutes late. Hopefully, I would still make the aircraft commander's crew brief. As I drove through the main gate, I was thankful it was past 6 AM—no ID check.

I unlocked my locker, grabbed my nav bag, helmet bag, and that pain in the butt—arctic bag. (In

1989 MAC Flight Safety Writing Contest Second Place



Alaska, we get to carry an extra bag six months out of the year.) After signing in on the crew orders, I signed off the latest FCIF and ordered a flight lunch at the front counter. The guys were already in the briefing room ready to brief. My mind went into full speed. I now remembered I was flying with the squadron commander. First impressions always count!

"Glad you could join us, Doug."

"Thanks Sir, sorry I'm late."

"No problem, just in time for the crew brief."

Fifteen minutes later we were on our way to hardstand 15. A quick check of the 781s didn't reveal any earth-shattering news; the C-130 was in good shape. We asked the rest of the crew if they wanted anything from the MAC terminal. Hearing two no's, we were off to check weather, stop at command post, check NOTAMS, file the flight plan, and eat breakfast. After putting weather on order, the commander and I proceeded to the command post while the copilot checked NOTAMS and started the flight plan.

"Good morning, this is Totem 55 ready for our face-to-face."

"I'll be right out. Sir, there's been a slight change in your itinerary. We now have you going to Galena and then Hooper Bay. Five pallets, weighing 20,200 pounds for Galena, then you'll have to reconfigure en route to Hooper Bay for rolling stock, no backhaul information is available at this time. We bumped your fuel up to 48. Have your nav cross-check the fuel and if you need more, just let us know."

"Okay, thanks."

"Sir," I said, "48 sounds a little high. I'll check it before we file the flight plan."

A quick check at weather indicated a nice field grade day to fly in Alaska. Hooper Bay was reporting some of the best weather in a long time. We caught up with the copilot in the flight planning area. No NOTAMS. Flight plan complete, almost right this time, just a minor change in the routing from Galena to Hooper Bay. I quickly verified the fuel load using locally approved procedures—48,000 pounds of gas would be more than enough to complete our round robin mission. No need to get gas at Galena. (That would make our engineer happy.) Should land at Hooper Bay at about 115,000 pounds gross weight.

The trip to Galena was uneventful, the "Great One" was visible for the entire climbout. Now that was good weather! It's rare to see the base and top of Mount McKinley on any given day. A quick stop-off at Galena, and we were en route to Hooper Bay. On the way out, we casually talked about the standard stuff aircrews always talk about—nice day for flying, can't wait for fishing season, yeah, just eight months to go! On the way in, we got a weather update from the site and some backhaul information. Weather was good enough to get in—not always the case. Our outbound cargo was a backhoe, weighing 17,250 pounds. This was going to be a time-consuming upload, probably an hour or so. I hope the windchill isn't too bad.

We hit the VOR on course and turned outbound. I flipped the doppler computer to the preset stage and we trucked outbound for seven miles, made our descent through a small cloud deck, and broke out VFR on a nine-mile final. The snow-covered centerline had been marked with a three-foot wide hydraulic fluid strip, so it was easy to see. We picked out the runway and made a visual lineup for Runway 13. Landing was in the last few feet of the zone, but still acceptable. No sweat at this site, at least you could go around and try it again. When the AC reversed the props, I was expecting a whiteout, but no fresh snow had fallen for a couple of days and the runway had been freshly plowed. It was, however, real slick, with temperatures around freezing. We taxied forward and parked to one side of the runway. After engine shutdown, the flight engineer volunteered to stay on the flight deck and guard the APU. (Actually, this was a ploy to eat his lunch in peace and compute some takeoff stuff.) The rest of the crew, including the squadron commander, went to the back to see what we could do to help the loadmaster. We were just a little surprised to see a Caterpillar pull up behind the airplane. Seems the backhoe had blown an oil line. They would have to repair it and put it on the next airplane. The loadmaster told us Caterpillars are relatively easy to load, but neglected to mention the hard part; tying it down is a pain. There're no tiedown points on the CAT; you have to use the axles. The loadmaster told us to start putting down some shoring. (It looked like two-by-twelve boards to me, but he's the boss, so we put down some shoring.) The driver maneuvered the CAT as if he and the machine were one and the same. There was barely room to spare on both sides. The loadmaster had him stop the machine somewhere near the middle of the wing root. After a few minutes sucking diesel fumes, he told the driver to lock the brakes and shut it down. Then we started getting chains and devices out of storage boxes. Sixteen chains for forward restraint and

eight aft. After a few feeble attempts trying to put a chain in the latching end, the load showed me how to put the chain in, latch the device, and then rotate the tightening ring. Must have been pretty simple; I was even able to show the copilot how to do it. After some confusion on where and how to tie this thing down, we were finally able to get it close to a diagram in one of the loadmaster's books. The bad news started when the loadmaster told the flight engineer we had a Caterpillar instead of a backhoe.

"Hey, I'm sorry, we were too busy working in the back. The real weight of the bulldozer is 32,850 pounds, not 17,520. Better play it safe, use 35,000 pounds. How much will that throw your data off?"

"A heck of a lot. That puts us at 150,000 pounds gross weight. I'll have to recompute all my data. Takeoff distances are going to be real close. We may not have enough runway."

The engineer proceeded to compute his magic numbers, which of course are based on exacting air and motion laws developed by scientists such as Newton, Charles, Boyle, etc. All of which I'm sure are personal heroes of the engineer. After much squinting and adjusting, he announced we could make the takeoff, but only if nothing went wrong. This didn't cause much concern, since the Herk seldom had problems in the short 30 seconds she usually spent on maximum effort takeoff roll. We all got in our seats and began running appropriate checklists. The loadmaster was on the ground, waiting to start engines, and muttering something about always having to wait on us front-enders. The engines came to life and were running perfectly as we taxied out for takeoff. As we neared the end of the runway, the AC started briefing the takeoff.

"Crew, attention to briefing. This will be a standard max effort takeoff. Copilot, state GO at refusal (Vr) of 74 knots and ROTATE at Vmca takeoff speed of 107. Nav, for the acceleration time check, state TIME at 14 seconds. At that point we should be within 3 knots of 60. Torque management will be standard. Engineer, call passing 15,000 and the copilot will fine tune them from there. Co, if we start sliding before power is set, I'll release the brakes and you set max power as quickly as possible without overtorquing the engines. If anyone sees reason for aborting before hearing the word GO, state the word REJECT followed by a short description of the problem. After GO we'll treat it as an airborne emergency. Have I forgotten anything?"

The engineer had something to say. "Sir, we have minimum field length for max effort takeoff (corrected for Vmca) which is legally all we need, but our critical field length is over one thousand feet longer than the runway length; just to let you know. Also Vmcg (ground minimum control speed) is 100 knots, giving us a pretty significant refusal/Vmcg split."

"Thanks engineer, anything else? Okay, let's do it."

I always wondered what he meant by "legally all we need but" and "just to let you know." It always sounded as if here's the good news and now the bad news. The AC advanced the throttles and the engineer called 15,000 as we broke loose and started to slide. I started my trusty stopwatch to keep track of our acceleration. How many times have I done this same thing without ever rejecting for anything, much less slow acceleration? I kept an eye on it though, waiting to say "TIME." As we accelerated down the semi-short 3,600-foot strip, the engineer noticed a momentary TIT fluctuation on Number 4, then it stabilized as if nothing was amiss. Hoping it was just a quirk in the system, he sat silently, keeping a watchful eye on the offending power plant. I said "TIME" and, passing the point of no return, the copilot stated GO at 74 knots. A moment later the suspect Number 4 TIT fluxed twice and the engine flamed out.

"Pilot, engineer, Number 4 . . . flameout!"

I felt a sudden swerve to the right, so severe my body was thrown against the shoulder straps. Confused, I found myself looking off the right side of the runway. With a frantic voice the pilot yelled "FEATHER FOUR" as he struggled with the controls, trying to find enough rudder at 85 knots to overcome the asymmetric force created by the windmilling prop. The copilot pointed at Number 4's condition lever. Receiving an immediate thumbs up and "you've got it" from the engineer, he quickly moved the condition lever to feather. Realizing rudder wasn't enough, the pilot retarded Number 1 throttle, and the nose straightened out just in time to keep us from exiting the runway. Hugging the far right side of the runway at a slow speed and accelerating slowly, we waited and hoped for that magic speed at which the engineer said there would be enough air flow over our wings to support the heavy Herk. The end of the runway was coming fast, but our hearts were beating faster. Our speed was becoming respectable, but not quite 107 knots Vmca. As the end came, still a few knots on the low side of Vmca, the pilot, with no choices left, pulled back on the yoke, raised the right wing, and called "gear up." The Herk seemed to crawl into the air, the props

clawing desperately at every last molecule of available air. Slowly, ever-so-slowly, we gained airspeed and milked the flaps up in very small increments. With a sigh of relief we all breathed again and were simply glad to be airborne, and not a permanent part of the local surroundings.

"Damn! That was close."

"Too close!"

That was all that was said as we climbed out and reflected on what had almost been a catastrophe. So, that was the bad news. When an engine fails after refusal speed, you're committed to continue the takeoff. However, if you haven't reached Vmcg, asymmetric thrust is too great to keep all engines at maximum power. Consequently, you are too slow to safely continue the takeoff. You're stuck between the proverbial rock and a hard place. After level off, I stood up and glanced at the engineer, who looked up and shook his head as if to say, "I'm too old for this!" After receiving appropriate clearance from Anchorage Center and declaring an emergency, we settled down to a short discussion of recent events.

"Engineer, pilot. What happened to Number 4?"

"Well sir, I noticed a small flux in the TIT somewhere around 45 knots, but it immediately settled down. Then all of a sudden she unwound right after refusal."

"Why couldn't I keep her straight?"

"Well, at 85 knots we were well below Vmcg, so Number 1's torque was more than you could overcome with the rudder."

"The only thing I could think of to do was reduce Number 1 to help straighten her out."

"That saved us and, in this case, was our only choice. The problem is, when you do that the acceleration distance increases, making it extremely unsafe. We were lucky we had enough airspeed at the end of the runway."

"But according to your data we *didn't* have enough airspeed."

"Fortunately for us sir, reduced torque on Number 1 also reduced Vmca. By how much we don't know, but we were in NO MAN'S LAND and didn't have much choice but to try it. Your knowledge and instincts served us well. I only hope other crews have the same good fortune as we did."

"Before takeoff you briefed the Vr/Vmcg split. Since we legally don't use it on max effort takeoffs, I didn't pay much attention. However, it's definitely a player on all takeoffs, regardless of the type. Next time I'll pay more attention and have a better plan of attack in case I ever find myself in NO MAN'S LAND (between refusal and ground minimum control speed) again. In some cases stopping might be the better choice. I've certainly learned a valuable lesson today, and this analysis really helped me understand what happened and why."

"Sir, every situation is different, requiring different solutions. That's why it's so important we understand what the numbers really mean, learn from experience, and not become robots."

The rest of the trip home was uneventful and real quiet. After debriefing, maintenance, and filling out our bubble sheets, I headed off to the south part of town to pick up Missy. As I parked the truck in front of the school, Missy and a thousand other screaming scholars came running out. As she approached, I saw her beautiful smiling face and was overcome with emotion. Picking her up I gave her a kiss and a big bear hug. My twelve-year-old gave me a funny look as if to say, "Not in front of my friends, they'll think I'm daddy's little girl." Little did she realize how close I came to being a part of a safety mishap briefing at *your* next commander's call. ★

Maj. Douglas W. Houpt is Chief Navigator, 17 TAS, Alaska. MSgt. John R. Latham is a Flight Examiner Flight Engineer assigned to the 17 TAS, Alaska.

Which Way Is Up?

What the heck is a somatogyral illusion?

"Good morning everyone. I'm Captain Jake Smiley. I'll be your instructor for this period. We'll be covering several topics, but we'll mainly cover the subject of spatial disorientation. Now, most of you have been through the spatial disorientation trainer, but how many are still thinking, 'It can't happen to *me*?' "

No hands went up, but Capt. Brad "Mac" MacKenzie, along with several others, glanced furtively around the physiological training classroom, where he and about a dozen other crewmembers were attending their once every-three-years refresher course.

"Well, I thought there were some honest people here today, but I can tell by the quick little looks you've exchanged what you're thinking. But I don't blame you. Most crewmembers know a little about spatial disorientation, but no one thinks it can happen to *them*. Neither did the crew I'm going to tell you about today; but it did. Fortunately, they lived to tell about it, so you can all learn some hard info along with all the theory and biological mumbo-jumbo. This incident also points out how mechanical and crew coordination failures can lead to some real problems—especially when you don't follow the first rule in any Dash One about dealing with emergencies and other situations—*Maintain Aircraft Control.*

"In this case, a multi-engine strat airlifter and crew were to fly a relatively short hop back to home base. During the flight engineer's preflight, he turned on both INS units and inserted present position. Later, he saw the red battery light for INS 1 illuminated. He turned both INS units off, back to align, and reloaded present position. When the pilots arrived, the copilot confirmed the correct present position had been loaded, but didn't recall seeing either battery light illuminated. When the pilot got to the flight deck, he saw the INS 1 battery light on, so he turned INS 1 off and then directly to the NAV position to bypass the battery test.

"Sometime prior to takeoff, some malfunction codes were cleared from one of the units, but no one could recall which codes they were or which unit displayed them. From then on, things were normal through takeoff. During climbout, passing 8,000 feet, the pilot's ADI began to tumble, and he saw the INS 1 INOP annunciator light, INS 1 ATT light, the

AWLS fault identification panel, and the INS 1 battery light, all illuminated. The pilot selected the Attitude/Heading Reference System (AHRS) for both Attitude Select and Mag Heading while the copilot checked INS 1. The copilot didn't notice any malfunction codes; however, the message 'FSAS mode degraded, INS CDU inop' was displayed on the FSAS CDU. Two to three minutes later, the pilot's ADI tumbled again. Neither observed any 'OFF' flags or AHRS fault lights, but the pilot transferred control and radios to the copilot. The pilot, flight engineer, and scanner began troubleshooting the problem. The copilot 'hand flew' the airplane while the scanner opened and closed both Test Programming Logic Computer (TPLC) circuit breakers. Sometime after this, the copilot engaged the autopilot.

"After being cleared direct to a VOR, the copilot began a right turn using the autopilot and requested an intermediate level-off at FL 260 due to navigation equipment problems. This occurred at FL 210. At FL 245, Center reconfirmed the FL 260 clearance and gave the crew a frequency change. Sometime during this period, the scanner opened both TPLC circuit breakers again, which disengaged the autopilot. This was the first crew coordination error, which helped precipitate future events.

"With the autopilot disengaged, the airplane entered an undetected left bank of about 15 degrees. The pilot was busy troubleshooting the AHRS, checking charts, and figuring ETAs. The copilot was flying the airplane (even though he didn't notice the autopilot kick off), tuning radios, and trying to keep track of the pilot and engineer troubleshooting the problem. So, you can see the chain of events leading to a mishap being built, one link at a time.

"After tuning the radio, the copilot looked up and sensed an abrupt pitchup to the right. He later said that outside visual cues showed the aircraft in level flight while his ADI showed a 15-degree left bank, with bank still increasing. He initially applied left aileron to counter what he perceived to be a *right* roll and told the crew his ADI was spinning and that the aircraft was in a right turn. At this point the copilot should have applied right aileron and, using his ADI, rolled the aircraft wings level.

"To compound their difficulty, at this time the airplane entered IMC, and the pilot looked at the copilot's ADI and saw a 45-degree left turn in level flight. Shortly thereafter, they both noted a flashing master caution light accompanied by an INS 2 INOP light and an INS 2 ATT light. Both pilots stated the turn and slip indicator showed the turn needle deflected right and the ball deflected left. To counter this perceived right-descending turn, both pilots applied full left aileron

and back pressure. Of course, these events happened very quickly.

"Fortunately for the mishap investigators, the flight data recorder was operating and recorded what happened next. Within 22 seconds, aircraft 'G' loading gradually increased from 1.1 positive to 4.6 positive. With continued left aileron application, the airplane rolled to a shallow inverted left bank of about 110 degrees. The airplane was now in a descending turn through FL 207, turning at 8 to 10 degrees per second with the airplane now heading 053 degrees. Approaching 350 knots, the copilot retarded all throttles to idle, and the pilot extended the spoilers to the flight limit. The airplane maintained an average 4.0 positive 'Gs' for the next 12 seconds, when the load gradually increased. Also, during those 12 seconds, the airplane accelerated to a maximum speed of 374 knots calibrated airspeed and 4.7 'Gs'.

"By this time, the airplane had transitioned to a steeply banked upright left turn in near level flight at about 16,600 feet, turning at 10-12 degrees per second through 279 degrees. The airplane remained relatively level for about 8 seconds, and loading reduced to about 2.2 'Gs'. A few seconds later, renewed left aileron application again rolled the airplane inverted, and then transitioned to an inverted right turn descending through 15,400 feet and heading 225 degrees. Airplane loading again increased to 5.5 positive 'Gs' and airspeed built to 391 knots. In about 12 seconds, the airplane was heading 339 degrees, in a right turn at one degree per second and in a near vertical pull. The airplane was again level at about 9,700 feet under 4.4 'Gs' positive loading.

"During the next 6 seconds, the turn was reversed to the left at 2 to 4 degrees per second while climbing to 11,500 feet. Soon after that, the airplane was heading 184 degrees and descending past 9,200 feet. The left turn continued to a heading of 154 degrees and the airplane descended to 8,100 feet, where it entered VMC and the crew was able to recover.

"Quite a mouthful, right? But that's what happened. *Why* it happened will take more explanation, so stick with me. Layered clouds, and a large stratocumulus bank below and to the right of the airplane, cirrus clouds, and haze in all quadrants, eliminated a definitive, true horizon. These conditions are very conducive to false perceptions of the horizon and aircraft attitude should disorientation or an unusual attitude occur.

"But weather conditions don't cause disorientation; people usually cause it all by themselves, and that's what happened in this case. As I mentioned earlier, the copilot was controlling the airplane when it went into an unperceived *left* climbing turn. According to medical folks at Brooks, this turn was enough to stimulate the crew's vestibular systems. The copilot initially misinterpreted the airplane as flying straight and level, using a sloping cloud deck as a visual cue. Then the copilot had his head in the cockpit for about 10-15 seconds, either in a down or down and left position. As he looked up and out of the airplane, his vestibular system was restimulated and he perceived a climbing *right* turn. This could possibly have been the coriolis illusion, which results when you turn your head abruptly during a prolonged turn. None of the other crewmembers looked out of the airplane at that time, thus they didn't perceive the sudden up and right pitch.

"Due to previous attitude instrument failures and spatial disorientation, the copilot didn't believe his ADI, and announced to the crew that his ADI had failed. The pilot, distracted by other duties, was also conditioned by previous attitude instrument failures and the copilot's announcement, causing *him* to misinterpret the copilot's ADI. During the entire left turn maneuver, the airplane was in weather. The pilots continued to sense a right descending turn despite applying full left aileron with back pressure to pull out of the dive. This somatogyral sensation is, in effect, a graveyard spiral. As they started to level off, the vestibular system was severely stimulated so that the pilots continued to perceive a right descending turn and kept applying full left aileron with back pressure. If the pilots had not regained visual cues as they came out of the cloud deck, they probably would have impacted the water in an ever-tightening left spiral.

"I see some eyeballs starting to float out there, so let me sum up. The pilots experienced what we physiological folks call Spatial Disorientation, Type 1, or Unrecognized, which was enhanced by flying in weather, being forced to fly on partial instruments, distractions at the start of the maneuver, increased anxiety due to instrument problems, not maintaining adequate visual reference, misinterpreting the horizon by using a sloping cloud deck, and making incorrect control inputs to the actual aircraft attitude. Finally, the copilot didn't recognize that the severe up and right pitchup he perceived was spatial disorientation and the result of aircraft control inputs.

"Now, is there anyone out there who still thinks *'It can't happen to me!'* "

The Less We See The Longer The Look

By Capt. Louis DeWitt

Unfortunately, many airline accidents are random events defying classification. This frustrates investigators as well as flight operations managers who are looking for patterns. For without patterns, the efforts directed toward renewed emphasis or modified policy are less enthusiastically received. In our profession, a happenstance tends to fall within the realm of acceptable risk.

In contrast, some accidents do lend themselves to classification. In these, accident investigators can point to a commonality in at least one of the causal factors. It is to this type of accident we address this discussion.

Air Carrier Approach Accidents

NTSB Studies Of Air Carrier Approach Accidents

Studies of low approach accidents have shown these accidents nearly always occur after visual contact is established and the aircrew transitions from instrument to visual flight. In practically every instance, the quality of a visual scene considered satisfactory at, or before MDA/DH, became degraded as the aircraft descended closer to the ground. Considering all pilots are trained to know the difference between IFR and VFR meteorological conditions, it behooves us to consider this phenomena in expanded detail.

This is VFR? Caveat Emptor

As we take a closer look at the low approach accident scenario, we find there may be at least a trace element of human inadequacy unique to the limited visibility environment. This imperfection occurs when pilots transition back and forth between borderline adequate and marginally inadequate visual cues. The fundamental problem is related to the way aircrew respond to a complex of nearly imperceptible visual scene deficiencies. The critical aspect is that the pilot, being unable to correctly interpret the scene as flawed, becomes preoccupied with unproductive visual scanning at the expense of timely integration of flight instrument data. In a variation on this same theme, accident histories showed pilots were hesitant to commit to an unequivocal return to instrument flying after once having transitioned to VFR flight.

We don't have to look too far afield to find the weather conditions characterized in this analysis. Any approach where final approach path is under the influence of a dynamic meteorological condition qualifies. For example, variable intensity rain showers, non-homogeneous fog, slant range reduction of visibility due to fog, or even night approaches over unlighted terrain fall within the scope of this analysis.

Pilots have to contend with a strong compulsion to extend visual scanning tasks when visual information is of low quality. This we would expect, however, in the accident examples. The pilot is so intent on interpreting the visual scene, he or she compromises the timely scan of flight instruments.

"There may be at least a trace element of human inadequacy that is unique to the limited visibility environment."

Overall cockpit management suffers. Also, significantly, the pilot not flying was found to be just as susceptible to overconcentrate on outside scan and, therefore, the failsafe checks that would normally prevent an accident are lacking.

Normal Pilot Training And Checking

Let's take a minute to review our conventional low approach training. Normally, our training (with the possible exception of LOFT) cannot exactly duplicate what pilots experienced in these accidents. In the typical training maneuver, the runway environment is usually either clearly in view or clearly out of view at MDA or DH. Shades of gray are difficult to create. Furthermore if, after breakout, the syllabus calls for a missed approach, all visual cues probably disappear and the pilot has no choice but to execute a missed approach.

Just as troubling, pilots can easily memorize the syllabus. With this, the maneuver requiring the missed approach is known beforehand. This completely eliminates any possibility of a real world simulation.

So it's apparent that at least portions of our flight simulator training cannot exactly duplicate actual flying, at least with respect to visual scenarios a pilot may eventually face on a final approach course. This is significant because, at some time during the course of a pilot's flying career, he may encounter the subtle metamorphosis of the VFR scene that occurred during these accidents.

How Do We Learn From Our Experiences?

If we are to benefit from the lessons we learn from accidents, we have to follow the same procedure we would in solving any problem. First, we identify the problem. In this case, the problem relates to a pattern of aircrew preoccupation with substandard visual cues on instrument approaches. Next, we have to develop a course of action. The following paragraphs contain suggestions for the prevention of future approach accidents.

Altitude Awareness

Awareness of aircraft altitude during approach is absolutely essential. There is nothing ambiguous about this. It has been a truism since Day One. Yet, pilots seem much more willing to integrate altitude callouts and or individual altitude instrument scan during actual instrument flight than during visual flight. Let's face it, pilots just naturally like to look outside the cockpit during final approach.

Moreover, altitude callouts are added work. They usually require mental arithmetic and, for this reason, no one is going to make altitude callouts they consider superfluous. But, we must somehow compensate for the possibility that pilots may one day experience the progressive degradation of the final approach VFR scene and fail to revert to IFR instrument scanning. Consequently, there is probably only one best solution to the problem. It involves procedurally mandated redundant altitude callouts from the pilot not flying during the visual segment of all instrument approaches.

The Approach Coupler

There has never been an accident where the aircraft was coupled to the ILS to the minimum altitude certified for the aircraft type. (The minimum certified approach coupler altitude is published in the FAA Approved Manual.) Why is this? Because the approach coupler has no tendency to duck under. The aircraft will follow the ILS glide slope, and this insures it will cross the threshold in a stabilized configuration. Pilots should be encouraged to use the ILS approach coupler to threshold whenever approach aids and aircraft systems permit.

Summary

As long as we continue to fly nonprecision and other hand-flown instrument approaches, we should place periodic emphasis upon the special importance of final approach altitude awareness. Every approach cannot be a coupled ILS. The MDAs for nonprecision approaches are often in the range of 800 feet AGL and higher, and transition from IFR procedural discipline to VFR discipline can take place at similar altitudes. Accident investigations have shown that subtle changes in the final approach visual scene can effect critical but, at the same time, imperceptible deficiencies for continued VFR flight. Flight crews should follow procedures designed to compensate for the possible lapse in the spontaneous and crucial updating of flight instrument data, particularly altitude awareness during flight in marginally VFR meteorological conditions on final approach. ✈

Courtesy: *Delta Airlines—Up Front*

Flying-Hour Milestones

10,000

312 MAS
MSgt. William W. Higgins

7,500

30 MAS
SMSgt. Robert C. Bloom, Jr.
SMSgt. John B. Tigdon
MSgt. Larry A. Ludwig
MSgt. Freddie L. Middlebrooks, Jr.
MSgt. Barry L. Watts
MSgt. David E. Williams

37 TAS
MSgt. Arnold R. Dutton

41 MAS
TSgt. Dale E. Saunders

55 AAS
Maj. William C. Hale

176 COMP GP
Brig. Gen. Edward A. Belyea

443 MAW
Lt. Col. James L. Farmer
MSgt. John C. Funk

910 TAG
Lt. Col. Richard T. Dietrich
Lt. Col. Kenneth E. Gould
Lt. Col. Charles L. Mickley

5,000

6 MAS
MSgt. Rocco Bollotta
TSgt. Mark S. Biagi

16 TATS
TSgt. Charles J. Delorenzo
TSgt. Patrick D. Hutton

17 MAS
Lt. Col. Albert A. Barnes

30 MAS
Lt. Col. James Anderson
Lt. Col. Forrest C. Brown
Maj. Robert P. McAdams
CMSgt. Charles L. Burke
SMSgt. Jimmy L. Bryant
MSgt. Charles J. Evanich
MSgt. Edgar B. Harris
MSgt. Charles P. Hayes
MSgt. Wayne E. Rauschenback
MSgt. William H. Taylor
MSgt. Albert J. Walcek
TSgt. Joe N. Daniels
TSgt. Wayne F. Marter
TSgt. Michael D. Piasecki
TSgt. Michael D. Smith
TSgt. Lawrence S. Spring, Jr.
TSgt. Carey Thomas
SSgt. Stephen Banks
SSgt. Alfreed Bese
SSgt. William Henriquezmaldonado
SSgt. Thomas A. Kenny
SSgt. Scott J. Peltier
SSgt. Raymond F. Pleva
SSgt. Daniel Wiggers
Sgt. Kirk D. Sweger

41 MAS
Lt. Col. Terry G. Perkins
TSgt. Barron L. Wilkins
TSgt. Carl E. Cole
SSgt. Stuart C. North

50 TAS
Lt. Col. Loren C. Ainsworth/CC

57 MAS
MSgt. James L. Bond

75 MAS
Capt. Robert G. Hvisc
Capt. Michael J. Karaffa
SMSgt. Charles W. Blair, III.
MSgt. Thomas P. Kelley
MSgt. Robert E. Krempin

76 MAS
Maj. Douglas N. Cain

86 MAS
TSgt. Katherine M. Perry

176 COMP GP
Lt. Col. Van P. Williams

312 MAS
Maj. Glen D. Woolen
MSgt. Maurice W. Harold
MSgt. Randy J. Leonard
MSgt. Shawn R. Sanborn
TSgt. Robert N. Jensen

349 MAW
Maj. Steven D. Baily

443 MAW
SMSgt. Charles R. Padgett
MSgt. Stephen L. Blackwell
MSgt. George E. Liley

907 TAG
TSgt. Glenn P. Cary

910 TAG
Lt. Col. John E. Wingerter
Maj. William P. Kane

2,500

3 MAS
Lt. Col. Gerald L. Brown
Lt. Col. Jamie H. Jamieson
Lt. Col. Bryan W. Kraft
Lt. Col. Daniel R. Lonneman
Lt. Col. Gordon L. Minner
Maj. David A. Bell
Maj. Peter A. Blatchley
Maj. Todd H. Hohberger
Maj. Douglas H. Lloyd
Maj. Allan W. McVicker
Maj. Edwin Palmer, II.
Maj. Marshall Siler
Maj. Dennis O. Vance
Capt. Theodore W. Boward
Capt. Charles C. Cermak
Capt. Charles R. Dobbins
Capt. Randall J. Larsen
Capt. Scott E. Lewis
Capt. Daniel E. Opp
Capt. Randal C. Peters
Capt. Daniel C. Reeder
Capt. Thomas J. Robbins
Capt. James C. Runk
Capt. Robert S. Satre
Capt. Gayle Westbrook
Capt. David L. Yankovich
CMSgt. Jonathan R. Andrews
CMSgt. Claude R. Isenhour
SMSgt. Roddie W. Byers
SMSgt. Michael Clodfelter

SMSgt. Garry A. Cornwell
SMSgt. Larry E. Koewing
SMSgt. William F. Lewis
SMSgt. Paul D. Mullins
SMSgt. Jakob Seren
SMSgt. Jimmy G. Wyatt
MSgt. Michael Arthur
MSgt. Frances M. Cardaci
MSgt. Robert L. Downs
MSgt. Delbert E. Fox
MSgt. Robert J. Harris
MSgt. Edwin Justiniano
MSgt. Ralph J. Krause
MSgt. David E. Ledsome
MSgt. Charles M. Longenberger
MSgt. Benjamin L. Lucas
MSgt. Gary W. Ludwig
MSgt. Ernest G. Magers, Jr.
MSgt. James P. Maurer
MSgt. Kevin F. Mayer
MSgt. Timothy M. Milligan
MSgt. Dennis M. O'Donnell
MSgt. Kenneth C. Powell, Jr.
MSgt. William F. Richmond
MSgt. Ronald D. Schafenberg
MSgt. Michael B. Thompson
MSgt. Jimmie D. Victor
MSgt. Jame F. Warren
MSgt. Rufus I. Winstead, Jr.
TSgt. William H. Graham, Jr.
TSgt. Ralph A. Gregson, Jr.
TSgt. Atron G. Hartfield
TSgt. Danny F. Jennings
TSgt. John G. Jilek
TSgt. Everett Lewis, Jr.
TSgt. Michael McCausland
TSgt. Gordon D. Moser
TSgt. Norman A. Norcisa
TSgt. James B. Pearson, Jr.
TSgt. Philip O. Stewart
TSgt. Ronald S. Stough
TSgt. Rodney E. Williams
SSgt. Robert R. Banks
SSgt. Jackson Chin
SSgt. Steven C. Cornish
SSgt. Craig R. Dohner
SSgt. Reginald L. Dumas
SSgt. Douglas F. Goertz
SSgt. Timothy J. Harrington
SSgt. Mark Hill
SSgt. David W. Knight
SSgt. Jay S. Messenger
SSgt. Douglas A. Morehead
SSgt. Donald W. Riser
SSgt. Robert Santiago
SSgt. James M. Saunders
SSgt. Wayne B. Skinner
SSgt. James H. Sprau, Jr.
SSgt. Peter R. Tornoe
SSgt. Stuart L. Welch
SSgt. David L. Wilson
SSgt. Tyrone C. Wynn
Sgt. Joseph M. Cadiz
Sgt. Kenneth E. Pressley

10 MAS
Capt. Alvin Penfield

16 TATS
Maj. Douglas M. Allen
TSgt. Grover E. Hicks
TSgt. Wayne R. Jacques
TSgt. William A. Lambert
TSgt. Jimmy R. Murphy
TSgt. Noel W. Whaley

20 MAS
Capt. Mark W. Metzger

37 TAS
Lt. Col. James N. Soligan
Capt. Phillip A. Misseldine
SSgt. Charles F. Lesley
SSgt. Michael J. Kazmierski

50 TAS
Capt. Don S. Kinsey
Capt. Michael L. Morrissey

53 MAS
Lt. Col. Dennis W. Kullander
Lt. Col. Herbert L. Stoddard
Maj. Alan E. Berg
Maj. Gary R. McCloud
Capt. Timothy L. Gulliver
SMSgt. David J. Hedrick
TSgt. Troy Wolze, Jr.
SSgt. Nicasio L. Bautista
SSgt. Todd A. Hassel
SSgt. Mark J. McAlpine
SSgt. Mark R. Nitta
SSgt. Laurel L. Taft
SSgt. Paul C. Zukoski
Sgt. Dante A. Mutti
Sgt. Edgar V. Wilson, Jr.

172 TAG
1st. Lt. Roger D. Clark

176 COMP GP
Capt. David M. Montague
Capt. Thomas P. Mulcahy
TSgt. Robert M. Stamm
SSgt. David E. Peck

443 MAW
Maj. Brian W. Miller
Maj. Charles M. Tozier
Capt. Robert M. Haley, Jr.
Capt. Dwight L. Kenyon
Capt. Stephen O. McAllister
MSgt. Verna L. Moore, Jr.
MSgt. Michael J. Pelhemus
MSgt. Carl E. Thornton

907 TAG
Maj. Robert G. Speer
Capt. Edward T. Whiteley
MSgt. Richard J. Simon
TSgt. Arnold W. Atchison
TSgt. John D. Bloomberg
TSgt. James H. Faulkner, III.
TSgt. Kenneth D. Gould
TSgt. John C. Matthews, Jr.
SSgt. Curtis A. Greca
SSgt. Daniel J. Harmon
SSgt. Dennis K. Raffield

608 MAG
Maj. Peter G. Graf
Maj. Jeffery A. Miller
Maj. Michael E. Stefkovich
Capt. Gwen M. Linde

910 TAG
Col. James D. Bankers
Lt. Col. Albert K. Owen
Maj. Robert F. Belles
Maj. John D. Britto
Maj. James P. Dunn
Maj. Henry A. Jackson
Maj. Gary W. Kirr
Maj. Walter G. Kyle, III.
Maj. Mark W. Prentice
Maj. Mark E. Rensi
Maj. Harold G. Repasky
Maj. William W. Sassaman, Jr.
Maj. James R. Wagner
Capt. Leslie R. Anzjon
Capt. Louis L. Arko
Capt. Dwight L. W. Dailey
Capt. Martin L. Davis
Capt. Lee R. Hutchinson
Capt. David K. Irish
Capt. Kurt M. Kamrad
Capt. Mark M. Perkins
Capt. Steven Polakof
Capt. Scott P. Reichert
Capt. Richard S. Rozman
Capt. Gerry D. Skinner
1st. Lt. John D. Williams
SMSgt. Thomas R. Mason
SMSgt. Alvin J. Williams, Jr.
MSgt. David E. Cann
MSgt. Frank J. Marino
MSgt. Joe D. Pitney
MSgt. Edward W. Wright

Excellence in Airmanship

From Left to Right: Maj. George Macken, III, AC; SSgt. Pamela A. Sommers; MSgt. Lawrence J. McCann; MSgt. Harold W. Smith; SSgt. Michael N. Lopez; Lt. Col. William A. Bontly.

Maj. George Macken, III, and Crew, 99 MAS, Andrews AFB, Md, were on a Special Air Mission from Scott AFB, Illinois, to Andrews AFB, Md., 19 Sep 1988. The flight was normal until final approach to Andrews. When the gear handle was placed down, the gear didn't extend normally. Cockpit indications showed left main and nose gear down and locked but right main gear unsafe. After flying over the tower for a visual check, tower personnel confirmed the left main and nose gear appeared down and locked, and the right main gear retracted. The crew immediately initiated the Emergency Gear Extension Checklist in an attempt to use compressed air to blow the right gear down. After completing the checklist, the right main gear indicated safe, but now the left gear indicated unsafe. The nose gear still showed down and locked. Another visual from the tower indicated all gear appeared down. The crew accelerated to 220 KIAS and yawed the aircraft in an unsuccessful attempt to use air loads to force the left main gear into place.

The crew initiated a Conference Skyhook and discussed the situation with various agencies. Meanwhile, the pilots entered a holding pattern to burn down fuel and review all their options. At the suggestion of a Gulfstream engineer, the crew attempted, unsuccessfully, one more blow-down of the gear. A final visual check from the tower confirmed all three gear appeared down. The crew attempted the final flight manual procedure—a modified touch and go with a slight skid. They flew the approach in an attempt to force the left main gear to a safe condition. Just at lift-off, the left main gear indication changed to safe. Captain Macken flew a flawless approach and landing and stopped the aircraft on the runway. MSgt. Harold W. Smith, FE, pinned the gear and the passengers deplaned.

The outstanding crew coordination and superior airmanship demonstrated by Major Macken and Crew successfully and safely resolved a serious emergency. They've earned the Excellence in Airmanship Award. Well done from *TMF*.

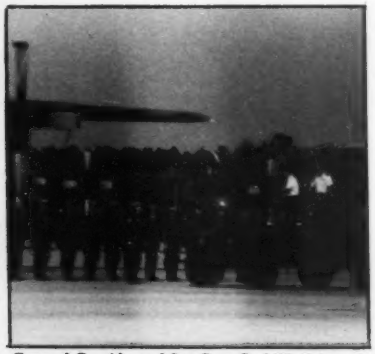
AIRLIFT R

C-130 gets escort to the DZ.

Story and Ph
By Maj. Steve Behr As

How lucky can you be! Only three weeks on the *TMF* staff and ordered to cover the most important airlift event of the year. I'd heard about Rodeo since its conception and I'd watched teams prepare for weeks honing their skills. But nothing prepared me for the excitement of a warm June morning with the Carolina sun rising over an assembled mass of airlifters anxiously waiting to demonstrate their skill in airdrop airmanship. They'd trained at home bases for months, and each wing sent their best aircraft and crew to compete in this total team effort.

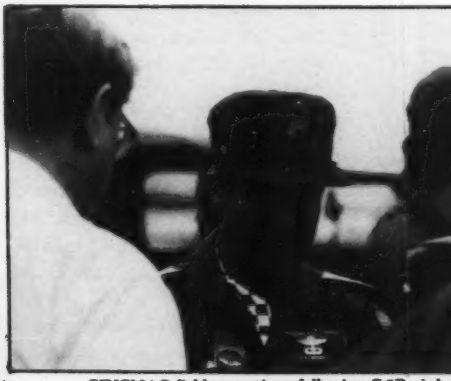
CINCMAC addresses Rodeo '89.



General Cassidy and Lt. Gen. Carl W. Stiner, XVIII ABN Corps Commander, review Rodeo crews.

435 TAW sets up tent keeping.

Col. Alfred C. Rivers, Rodeo Chief of Safety, explains DZ safety to Lt. Gen. Anthony J. Burshnick, CINCMAC/CV.



CINCMAC fields questions following C-5B airdr

M551A1 "Sheridan" ready for airdrop.

RODEO 1989

d Photos
ır Associate Editor

The crews were nervously awaiting the arrival of the reviewing party. To keep spirits high, or maybe just relieve a little tension, the entire 60 MAW team was doing the "wave," much to the delight of the Marine Corps team opposite the Galaxy crew.

After the reviewing party greeted each team, team members strutted over to the grandstands for the formal opening ceremonies. From high above Pope AFB, MAC's finest combat controllers free-fell trailing multi-colored smoke, each jumper carrying the flag of a competing nation and each team cheering the arrival of their nation's flag. After the landing of the North Carolina flag, Capt. Rich Hall, MAC spokesperson, turned the microphone over to CINCMAC.

"Airlift Rodeo is back and better than ever."

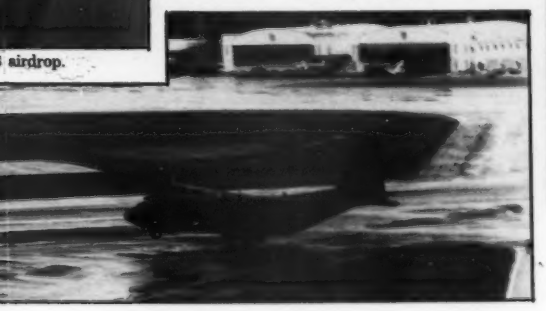
These were Gen. Duane H. Cassidy's remarks for the Airlift Rodeo '89 opening ceremony—the tenth Airlift Rodeo. General Cassidy told competitors they were all winners just by being there. Formations of C-130s and C-141s thundered across the sky to end the ceremony. It was then on to four action-packed days of competition.

Airlift Rodeo challenges the flight and ground skills of MAC aircrews, as well as related skills of combat controllers, security police, transportation, and maintenance team members. Rodeo provides valuable joint training for all participants and puts an end to all bar bets as to *who* is the *best* in airdrop.

Competing at Rodeo this year were 45 teams from MAC active duty, Air National Guard, Air Force Reserve, U. S. Marine Corps, and foreign teams representing Australia, Canada, France, Germany, Israel, Japan, and the United Kingdom. Observers were on hand from Algeria, Argentina, Belgium, Egypt, Indonesia, Malaysia, Morocco, Norway, Spain, and Thailand, in anticipation of

airdrop.

PI view of C-141 Heavy Equipment drop.

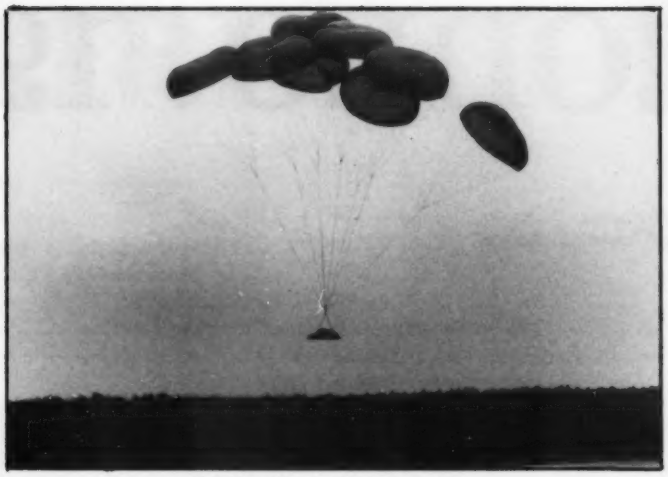


AFRES C-130 shortfield landing.

Windcheck—Army style.

Scores going up!

World record airdrop in progress.



Sheridan about to land at Sicily DZ.

73 combat troops complete record-setting drop.

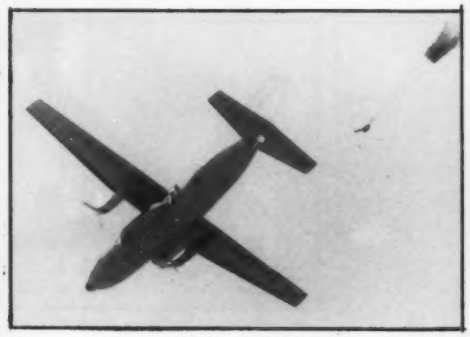
Accuracy landing the C-5 way.

sending a team to a future rodeo competition.

Before the competition began team chiefs were given safety tips to take back to their team members. In keeping with rodeo's tactical nature, the safety briefing had local "threats" and "enemy forces." Of particular importance to aircrews were numbers and location of Army chase planes used during airdrops for aerial photography. Most "Cowboy" aircraft were joined by a wingman from the IP into the DZ, and AAVS' combat photographers saw a lot of airdrops through camera view finders.

Despite morning low ceilings and afternoon thunderstorms, competition was completed with a minimum of reflys caused by weather. During one morning delay, I talked with the aircrew representing the 63 MAW, Norton AFB, Calif. This was the first Airlift Rodeo for some of the crew-

167 WSSF on combat patrol.



French C-160 drops off a few folks.

members, and they had some interesting observations. Maj. Jacob (Jake) Miller, Flight Examiner Navigator, 14 MAS, said "Rodeo is much more difficult than the ORI we just had. Here, there is zero tolerance all the way." Capt. Michael Drake, FEAC, 53 MAS, was impressed by how well 63 MAW maintenance folks had prepared their rodeo aircraft following a just-completed ORI.

Each rodeo has several "firsts." A big "first" this year was the participation of C-5B aircraft from Dover and Travis. The C-5s participated in EROs, accuracy landings (only 11 feet difference between the two wings), and low level flying.

On Wednesday of Rodeo Week, a C-5B from the 436 MAW, with Capt. Mark Hutchings in command, achieved a new record for heavy equipment airdrop by dropping four Sheridan armored reconnaissance vehicles and 73 combat equipped paratroopers. Crew briefing prior to the flight was normal: talk about weather, drop airspeeds (150 knots for heavy equipment, 130 knots for personnel), how ground and inflight emergencies would be handled, and a review of takeoff data.

On the first pass over Sicily DZ, the four Sheridans, each weighing 42,000 pounds, were successfully dropped. About six minutes later, 73 troopers from the 82d Airborne, each weighing in at 350 pounds with combat equipment, parachuted in. Total drop weight of 190,346 pounds was certified by a representative from the National Aeronautic Association, which sanctions aeronautical records. After the VIPs and guests departed, I went out on the DZ with part of the rodeo safety staff to check the condition of Sheridan Number One. As we approached, the driver (who had just jumped from the C-5) fired up the engine and a few short minutes later drove the Sheridan off the airdrop platform, proving the drop was a real success for both Army and MAC forces.

82d Airborne arrives.

Competition at Rodeo is not limited to aircrew and aircraft maintenance. Security police, combat controllers, and transportation personnel all have competitive events. I went on combat patrol with the 167th Weapon System Security Flight representing the 133 TAW (ANG). Before going on patrol, each team was briefed on the general condition of the course, hazards that would be encountered such as snipers and booby traps, and use of Multiple Integrated Laser Engagement System (MILES). After strapping on the MILES and picking up blank ammo, the team hit the trail. They found the first trap and were doing well until a sniper "killed" a team member, as indicated by a whine from the MILES. Three remaining squad members continued along the trail picking off targets. Then, when the trail turned down a steep embankment, the point man failed to see a booby trap and was taken out of action. The two surviving patrol members continued engaging targets until they ran out of ammo just before the end of the 600-meter course. As everyone hiked back to the start point, the umpire began totalling the score and providing a debrief. For this first-time team, it was a thought provoking learning experience they'll remember for a long time. As I was preparing to leave, aircrew members from Dover were

36 Sqdn, Australia, Best Overall Wing.

THE WINNERS

Gen. William G. Moore Trophy For Best Wing
- 36 Sqdn, RAAF Richmond, Australia

Best C-141 Aircrew
- 446 MAW (Assoc), McChord AFB, Wash.

Best C-130 Aircrew
- 36 Sqdn, RAAF Richmond, Australia

Best Foreign Aircrew
- 36 Sqdn, RAAF Richmond, Australia

Best C-141 Maintenance
- 446 MAW (Assoc), McChord AFB, Wash.

Best C-130 Maintenance
- 439 MAW, represented by 911 TAG (AFRES), Pittsburg, Pa.

Best C-141 ERO
- 446 MAW (Assoc), McChord AFB, Wash.

Best C-130 ERO
- 463 TAW, Dyess AFB, Tx.

Best C-141 Accuracy Landing
- 446 MAW (Assoc), McChord AFB, Wash.

Best C-130 Assault Landing
- 314 TAW, Little Rock AFB, Ark.

Best Combat Control Team
- 1723 CCS (Silver Team), Hurlburt Fld, Fla.

Best Security Police Team
- 1 SOW, Hurlburt Fld, Fla.

Best Joint Airborne Inspection
- 317 TAW, Pope AFB, N.C.

Best Aerial Port Combat Endurance Course
- 435 TAW, Rhein-Main AB, Germany

arriving to encourage their security police team.

Cheering crowds weren't limited to just the combat patrol course; non-flying team members could be found at every DZ rooting for their teammates. Big cheers went up at "EEECEE" (pronounced "easy") DZ during CDS drops when the 907 TAG (AFRES) got within 31 feet of PI—the best C-130 CDS drop. Fans from 62 MAW were elated when their team's CDS bundle landed within 38 feet of the smoke, scoring them as the best C-141 CDS crew. Not everyone did as well; a T-34 photo bird had to fly recon to find one stray bundle.

Soggy LZs forced all C-130 assault landings to be made at Pope. This made viewing easy for spectators, but judging hard for umpires. Officials' hands were grimy from feeling the assault strip for the hot spot where the wheels touched down. As CMSgt. Jack Cox said, "It isn't highly technical, but it's accurate."

As the week progressed and scores began covering the scoreboard, it was evident competition for best wing was very keen. Front runners were the 36th Squadron, RAAF Richmond, Australia; 446 MAW (Associate), McChord AFB, Wash., 438 MAW, McGuire AFB, N.J., and 435 TAW, Rhein-Main AB, Germany. The atmosphere was tense during the closing ceremony as both the 36th Squadron and 446 MAW came forward to receive several awards each. Then Maj. Gen. Frank Willis, Competition Commander, announced the 36th Squadron as winner, Best Overall Wing.

At last it was time for the teams to kick back, relax, and enjoy the afternoon as storm clouds parted and sunshine beamed down on all the winners. It was great to observe a week's worth of the world's best airdrop.

The Score

Find the reasons . . . .

By Mr. James B. Zazas
Carthage, North Carolina

A light snow was falling as Maj. James "Rip" Thomas negotiated his way through a thick grove of trees. The snow's gently falling whiteness hid the carnage underneath the towering pines' torn, overhanging branches. Major Thomas paused for a moment, looked skyward towards a small splash of blue and wondered aloud, "Why?"

Major Thomas was a member of a mishap investigation board. Beneath and around him were the remains of a proud aircraft. What had once been a beautifully sculptured piece of equipment was now a jumbled mass of twisted, burned and smoking aluminum, plastic, and insulation. Seven lives were lost in this mishap—a mishap that should have *never* occurred.

It was Major Thomas' job to find out what went wrong. However, in this case the "wrong" was readily apparent. The hard part was ahead. Find the "why" and convince others what should have been done "right." Major Thomas pondered his mortal position amongst the wreckage. His was oftentimes a thankless job, but one so important in the world of aviation.

A mishap investigation is a dirty, gritty, and many times, lonesome job. The sights seen initially by the investigator often leave the stomach queasy. Similarly, the thorough probe and the ensuing cleanup of the crash sight often leave deeply buried emotional scars on all participants. One never gets used to the aftermath of a catastrophic aircraft mishap. Major Thomas' quiet reflections were

1989 MAC Flight Safety Writing Contest Special Category

suddenly interrupted. "Hey, Major," a voice called from behind a large, bark-stripped tree. "Look at this. It looks like the plane took most of this county's cables with it."

The major threaded his way over the wreckage to the denuded tree. Standing next to it was a large gentleman, clothed in the standard issue Air Force winter coat. The six stripes on each sleeve announced the rank of this gentleman's position within the Air Force fraternity. His burning blue eyes revealed an intensity and total commitment to his job that made Major Thomas glad to have MSgt. Clancy Roberts on his team.

Sergeant Roberts pointed to the ground. Stretched for a hundred yards or more in one direction were heavy powerline transmission cables, the type one would find hung between tall towers of steel. A puzzled expression came across the major's face. "Is this cable the same type we found wrapped around Number 1 gearbox?"

Sergeant Roberts bent over and examined the cable. "Yes sir." He brushed the snow away from the twisted aluminum strands. Looking towards the major, he added, "It's the same stuff. This beauty is made to carry 60,000 volts."

Major Thomas was perplexed. The mission was a night low-level training flight over generally well lit, flat terrain. The crew was one of the best the wing had to offer for this demanding mission. Weather was excellent—clear skies, good visibility, and light winds.

So how in the world did the mishap aircraft snag a major powerline? Both slowly shook their heads as they realized the cable added one more puzzle to the developing questions of how and why.

Another question was forming on Major Thomas' lips when a second voice called from behind him. "Any luck finding the cockpit voice recorder, Rip?" Major Thomas swung around. He was greeted with a steely stare just as intense and burning as that of Sergeant Roberts. The eagle on this gentlemen's hat of blue cloth and silver braid reflected a singular beam of sunlight that penetrated the forest.

Col. Michael Richards joined the small party assembled in the forest. As board president, it was his job to make sure all players knew and understood their duties and carried out the investigation in an efficient and timely manner.

"Good afternoon, sir," Major Thomas responded. "No, the CVR has not been recovered yet. I have two teams looking for the black box now." Tapping the walkie-talkie strapped to his waist, he added, "As soon as we find it, I will inform you immediately."

The colonel nodded in approval as he shifted his gaze to the cable on the ground. "Rip, is this cable the same type we found embedded in the Number 1 gearbox? Where in the world did it come from? There are no major transmission lines in this area, are there?"

"Yes sir, this cable is most likely the same as we found yesterday. As to where, I have no definite answers. However, about ten to fifteen miles east of here the local power company has been stringing wire from the new power plant. I believe we . . . "

Colonel Richards interrupted, "Are you telling me this C-130 flew more than ten miles, trailing more than a hundred yards of cable?"

Even before Major Thomas could respond, the conversation was interrupted once again, this time from a disembodied voice coming from the radios strapped to both Colonel Richard's and Major Thomas' waists. "Blue One, this is Red One, over."

Colonel Richards grabbed his radio first. "Red One, this is Blue One, go ahead."

The distant voice continued. "Blue One, be advised that Charlie Victor Romeo is recovered. The item is intact. Request you and Major Thomas accompany item to base. The helicopter is inbound now. Over."

A smile came over the colonel's lips. "Roger, Red One. We'll be at your position in fifteen minutes." Colonel Richards holstered the radio. He turned to Major Thomas and Sergeant Roberts. "Well, gentlemen, it looks like we may have some answers in very short order. Rip, please indulge me. What do you think happened based upon what we've seen so far?"

Major Thomas drew a deep breath. He did not like to speculate so early in an investigation. But oftentimes, the answers came forth from such conversations. The major chose his words carefully.

"Sir, as you know, the aircraft was on a SOLL II mission. The crew was testing a new generation of night vision goggles the Army so very graciously loaned us. Somewhere, somehow, the crew snagged one of the cables being strung by the power company. The fact that no power outages were reported and the fact this cable is designed to carry a lot of juice gives us a good idea as to where it was snagged. Coupled with the fact this cable is similar, if not identical, to the cable we found yesterday wrapped around the Number 1 engine, I believe I can say the aircraft was experiencing or had experienced major flight control difficulties shortly before it flew into the ground."

Colonel Richards let out a long sigh, his breath condensing immediately into a light fog that shrouded the saddened expression on his face. "What you're painting for me isn't a very pretty picture. The command has just lost one of its most experienced crews for unknown reasons. Let's get to that chopper and accompany the CVR to the lab. Son, you may have just answered the 'how,' but we have to find the 'why.' Sergeant Roberts, you may accompany us if you desire. Let's get moving."

The ride on the Blackhawk was exhilarating. No matter how many times the two officers and NCO had ridden in a helicopter, the thrill of rotary flight awed and excited the three fixed-wing-experienced crewmembers.

However, their spirits were dampened somewhat by the cargo they were carrying. Swaddled in a bundle of rags and foam rubber was the mishap aircraft's cockpit voice recorder. The last earthly, consciously spoken words of a dead crew were contained within this box. Very shortly, the ghosts would speak.

The Air Force had learned a valuable lesson from the civilian airlines and installed CVRs on its transport aircraft in the early eighties. Initially, many flight crews balked about this "Big Brother" intrusion into the cockpit. However, their fears proved for naught. In just a few short years, these fantastic pieces of rugged equipment yielded answers about aircraft mishaps that would have left investigators hard pressed to find the truth as to the how and why. In the end, flight crews were rewarded with accurate answers which, in turn, enhanced their ability to learn from the mistakes of others and conduct a mission safely should a similar situation arise.

"Gentlemen, may I have your attention please." An officer, no more than twenty-five years old, addressed the assembled group of officers and enlisted people around him. His gloved

hands adjusted several knobs on equipment resembling a sophisticated stereo system. Glancing over his glasses, he added, "What you will hear is the actual recording from the CVR. Hence, there will no doubt be some static, unusual noises, and unintelligible conversations. In time, we will be able to provide a clearer tape, if desired. Without a doubt, we will be able to provide a complete transcript with a time-line sequence."

The young captain looked at Colonel Richards. "Sir, shall we begin?" The experienced airlifter nodded somberly.

At first, there was only static coming from the speaker placed upon the table. Suddenly, a ghost spoke, the voice of the ill-fated aircraft commander. ". . . Okay, gang, this one is for all the marbles. That drop was Sierra Hotel. Let's get down and dirty."

Against the static an unidentified voice added, "Heads up everybody. I think Big Daddy is going to take us for a ride . . ."

Almost immediately, the voice of the copilot chimed in, "Altitude five hundred, descending. Altitude check . . ."

"Don't worry, Co. I'm good. Check your gain, and by the way crew, can the callouts."

In the few seconds that followed, only static and the background drone of the transports's four turboprops could be heard. However, during those few short seconds, Major Thomas' face lost all color. He recognized the aircraft commander had just committed his crew to death. The tape continued, "Nav to pilot, we're about four clicks south of course. Suggest . . ." He was abruptly cut off. "Fine, nav, fine. Hey, co, give me your goggles. I want to count some cattle."

A few more seconds of static and humming continued before the AC spoke again. "Hang on, gang. This area is where I grew up. I used to hedge-hop the trees in my father's J-3 Cub. Ah, the barns and ponds are still right where I remember them. Hey, old man, it's one o'clock in the morning. Do you know where your children are?" The cockpit voice recorder dutifully recorded the ensuing tense laughter.

Against the static, there was some garbled conversation. The copilot was heard to say something about "What a way to run a ship." By the almost unintelligible nature of his conversation, it was obvious the copilot's comments were made without speaking into his headset.

Suddenly, in a shrill tone that startled all assembled listening to the tape, a voice rang out, "Descending, one hundred feet, bank thirty degrees. PULL UP!"

In the very next instant, a sharp report was heard, much like that of a rifle shot. In the same instant, the engineer's voice rang out, "Engine failure, Number One."

Almost immediately, the aircraft commander called out, "Pilot to loadmaster, scan the left side for fire. Co, on the rudder, full right rudder. I can't hold the son-of . . . "

"Loadmaster to pilot. You're trailing a wire from the right wing, lots of wire!"

"Condition lever—feather! Co, . . give me more . . ."

"Seven lives lost in a mishap—A mishap that should have never happened!"

"I'm trying, oh God, I'm trying . . . "

"Altitude, seventy five feet, DESCENDING!!"

". . . Fire handle—pulled."

"Trees! Twelve o'clock."

"We're going to hit! BRACE FOR IMPACT!"

The shrill sound of aluminum being twisted and broken came clearly across the speaker. So did the copilot's last words. "Mom, I love you." Then, abruptly, almost mercifully, the tape ended.

Nobody moved, nobody said anything for at least a full three minutes. Each man assembled around the table was lost in his own thoughts. Each man was trying to summon enough composure to say something.

Colonel Richard spoke first. "Those poor souls. May God have mercy upon them . . ." He raised his head, cast his gaze towards Major Thomas and added, "Rip, will you accompany me outside the room for a moment?" The reply was a weak, "Yes sir."

Outside the soundroom, Colonel Richards motioned Major Thomas to another room. Once inside, the very tired looking colonel began to speak in a trembling voice, "Rip, why do we keep losing good men and machines to stupid, incredibly dumb mistakes?" His question begged for an answer, but he neither expected nor wanted one.

The colonel continued, "In all my life, I have never felt anything like the way I feel now. We work so hard to ensure the safety and welfare of the crews that fly our aircraft. Sometimes, fate deals us a blow that we can chalk up to the proverbial 'Murphy.' Sometimes, Mother Nature gives us a sharp slap in the face. But, why, WHY does a pilot, with so much training, experience and sensibility fly his crew into the ground? We're PROFESSIONALS, not hotdoggers!"

Before Major Thomas could respond, Colonel Richards spun around, banged a clenched fist against the wall and walked quickly out of the room. Major Thomas stood there trembling. He'd never seen his boss exhibit so much rage before. But like the colonel, Rip felt a rage built up within himself too.

The door to the room opened once again. A familiar head poked around the corner. "Ah, Major. May I come in?" Thomas nodded to his friend and associate, Sergeant Roberts.

"Clancy, we've got our work cut out for us. The hows and whys were just answered," said Major Thomas in a slow, almost inaudible tone. Then he added, "We've got quite a report to prepare . . . a difficult report to prepare. And, we've got a lot of talking to do before the troops."

Sergeant Roberts looked at his friend approvingly and said, "Yes sir, we do."

Walking across the hallway to the lab that contained the cockpit voice recorder, both paused to look at it one last time before they left the building. Major Thomas spoke first, "Clancy, that box may have answered the basic how and why, but it will never answer the underlying reasons or processes that set up the crash. Seven men gone because of one man's unprofessionalism. Not an equitable score . . . I'll never be able to shake this one off."

Sergeant Roberts let out a long sigh. "Sir, if it's any comfort, neither will I, neither will I." ✈

Mr. James E. Zeuss, a faithful participant in the Writing Contest, is a B-767ER First Officer with Piedmont Airlines.

QUICKSTOPPERS

CELEBRATING 35 YEARS OF *TMF:* 1954 - 1989

SUICIDAL SEAGULLS
(July 1984)

The C-5 and its crew were minding their own business as they flew their training mission in the local pattern. Shortly after leveling at the MDA of 600 ft MSL on a TACAN approach, they were "attacked" by a small flock of seagulls, and the Galaxy crew heard the unmistakable sounds of birdstrikes from the underside of the fuselage. The flight engineer then reported MADAR was indicating an abnormal printout for the Number 1 engine, so the crew wisely decided to full stop and take a look.

Safely on the ground, maintenance folks found extensive damage to the Number 1 engine fan assembly and thrust reverser, and discovered a 1-inch by 6-inch hole in the Number 1 engine fan cowling. There was also evidence of birdstrikes on slats and flaps, and in all five wheel wells. Hardly a routine ending to a routine local.

INFLIGHT BRIDGE BUILDING
(October 1984)

The C-141 had been airborne for an hour on an airevac flight when the loadmaster began to detect strange fumes in the cargo compartment. All crewmembers, passengers, and patients went on oxygen as the search for the source began.

A quick inspection revealed the culprit was "acrylic solvent" brought aboard in a suitcase belonging to one of the duty pax. The substance, used in making and repairing dentures, was further identified by the dental clinic as "acrylic monomer" which is highly flammable and only available by prescription. Once the crew isolated the bottle in a plastic bag, the fumes dissipated and the flight continued normally.

The Best Man Stayed Home

By Capt. Douglas G. Dumont
620 MASSq
July 1968

The young captain sat at the desk, struggling with his thoughts. He was attempting to prepare a short talk for his class at IP school and was having a tough go. The assigned subject was "Checklist." What a dull subject, he thought, checklists! Ugh! Yuk!

"This is ridiculous," he moaned. "The Club Martinique is beckoning, and here I sit, struck dumb!" His thoughts were suddenly interrupted by a knock at the door.

"Hi there George, old buddy," his visitor exclaimed. "Your faithful friend, booze-um buddy and time-honored mail delivery man, is here."

As he entered the room he continued, "I was sent down here TDY to go through TTU and brought your mail with me. You know, through rain, sleet, hail, and all that good stuff." He threw several letters, magazines, and a couple of packages on the bed.

"What's on tap?" he asked as he started toward the kitchen. "I brought along a care package in case you're low," he said patting the sack under his arm. "Heard this was a dry state so I came prepared."

George was delighted with the diversion. He just wasn't in the mood to do any writing.

The next two hours were spent getting caught up with the latest poop at the squadron, including some rather bizarre speculations about who was doing what to whom!

Finally his friend got up, stretched, yawned, scratched, and said, "Come on, let's go out on the town. I start school tomorrow and this may be my last chance to howl."

"I'd really like to," George answered, "but I've got to prepare for my class tomorrow. I've been struggling with this damn thing all afternoon and haven't gotten a single concrete thought into my head. I'm afraid I'll have to pass. Besides, I haven't fully recovered from the weekend, physically or financially."

He finally got his reluctant visitor out the door and turned back to the desk. His eye scanned the room as he turned and caught the mail on the bed. His work momentarily forgotten, he reached over and thumbed through the letters. On the bottom was a rather large, bulky manila envelope, postmarked from his hometown.

Probably some local newspaper clippings, he thought as he picked it up, but it was too heavy and had a strangely familiar shape to it. Holding the envelope open, he dumped the contents out on the bed. He was quite surprised to see an old greasy checklist and a short note. He read slowly:

Dear George,

I got into a trunk where Dad's things were packed and found this old checklist. I am sure it must have been his. Since you are in the Air Force now, I thought you might like to have it. Mom said it was okay to send it to you.

Your best pal

Eddie

This is uncanny, he thought. It's downright eerie! Here I am trying to compose a talk about checklists and one is sent to me in the mail.

He picked up the old checklist and thumbed through it. As he looked at the emergency section, his thoughts wandered back several years to the events which led up to this particular checklist in his hand.

What was it doing in the trunk? he thought. He puzzled over this for several moments, reviewing all he knew of past events, and the man to whom this checklist had belonged. Suddenly, he knew! It finally made sense to him. He knew something no one else knew and it gave him a strange feeling—but he now had the substance of his talk!

The next day he was standing before his fellow IP students. He began his talk.

"You all know I was given the exciting subject of 'checklists' for my talk today. I gotta admit, I was really stumped for a while. What new thing can be said about a subject that has no human interest but is so important? Then a strange thing happened yesterday."

Holding up the old checklist, he continued, "This came to me through the mail. There's quite a story behind it.

"Many years ago, I had a very difficult task to perform. It wouldn't be easy for anyone, and I was only nineteen at the time. I had to tell an eight-year-old boy his father had been killed in an aircraft accident. The family lived next door to us, and the mother went all to pieces when she got the news. There weren't any relatives in town and naturally I volunteered to help in any way I could. At any rate, I had to pick up Eddie at school and tell him the news on the way home. I thought this 'checklist' subject was tough. Well, that one was a lulu!

"Eddie was at an age when he really worshipped his dad," he continued. "The news struck him in a strange way. There was no reaction at all; he just sat there looking at me. He didn't even cry. The realization didn't hit just then, which is easy to understand. His dad had been gone so much on trips that Eddie was used to his not being home every night. I knew it would hit him later, and it did.

"But getting back to this checklist," he said, "would you believe that this has been missing for over seven years? Eddie found it among his dad's things and sent it to me.

"Early in 1962, Eddie's dad went on his last mission. The aircraft crashed and there were no survivors. I didn't know any of the details until I read a copy of the accident report after I had come into the Air Force.

"The accident investigation determined that Number 3 prop had come off the airplane, gone through the fuselage, and severed the control cables. The aircraft became uncontrollable and crashed. The last readable radio transmission from them indicated the prop had come off and they were having control problems.

"The wreckage was badly burned, but certain facts could be established. From the position of the prop control lever, the crew had apparently attempted to feather the prop; however, the feathering circuit was inoperative and the prop was windmilling. The fire control handle was out; thus fuel and oil were shut off from the engine nose case. Later modification left the 'oil on' when the handle was pulled, but at that time it was automatically shut off.

"Anyhow, the prop was turning without oil and finally came off. The board discussed the reasons why the checklist hadn't been followed. One of the clean-up steps of the engine failure checklist was to turn the oil on, if necessary. This turned out to be a key point in the investigation. Why hadn't they followed the checklist? The crew knew the prop was windmilling; they had said so in their last transmission.

"The copilot's checklist was found. It was located at the rear of the aircraft still snugly tucked into his black flight bag. It was assumed the AC's was in the cockpit and destroyed in the crash. No trace of it was ever found!

"The primary cause was pilot error in that he did not follow proper procedures, etc. Of course, the faulty prop feathering circuit was a contributing factor.

"It's taken years to find the whole answer, and here it is!" Holding up the old checklist he continued, "Here is the only survivor from that mission. This checklist, which was left at home!

"Think about that for a minute. The crew never had a fair chance. THERE WASN'T A PILOT'S CHECKLIST IN THE COCKPIT! Small wonder that all the proper steps weren't accomplished.

"All the feathering had been done from memory—the memory steps. But often there are more than memory items, as in this case, and they're important too.

"The checklist is primarily a reminder, so that we will think about the things that have to be done, or may have to be done. It's like the Best Man at your wedding—to prompt you at the right moment. It's a guide, a tool, and should be used as such.

"Sometimes we deviate from the checklist, rightfully so, if there is a good reason to do so. As each Dash One says, there's no substitute for good judgment, and when you get right down to the nitty-gritties, that's why we wear wings, get flying pay and sit in those infernal flying machines. We have that mysterious ingredient machines can't duplicate, and that's judgment!

"But in spite of our ability to evaluate emergencies and make sound decisions, we also tend to get excited when things go wrong. This points up the main reason we have to use checklists. It's certainly not because pilots are stupid or have poor memories. It's just that the human, when excited or saturated, or at the end of a long crew duty day, is not infallible.

"I know each of us has experienced a moment when our minds went blank at a critical time. I have a friend who couldn't remember his wife's first name when he was trying to introduce her to his commander. That was comical, but can you imagine the embarrassment and panic in the gentleman's mind at that moment? Put that situation in an aircraft with an emergency without a tool to break the 'brainlock,' and it could be fatal.

"The checklist gives us a review of steps that normally have to be taken in a given situation. It's another tool in our arsenal to help us operate safely. Use it each time as though your life depended upon it. Who knows? It may!"

During lunch break, the bulk of the class went to the club to eat. George sat down at a table with one of his fellow students.

After a few minutes, the talk drifted to the morning class. "Say, that was quite a talk you gave," the other student said. "It was really effective, giving it a personal touch, so to speak. Tell me, was it all true? You know, about Eddie being your neighbor and all that?"

"Well, yes, for the most part," George answered. "After the accident, Eddie and I became very close. I didn't work full time that next summer and spent a lot of time with him. We went fishing several times, and I helped him with Little League. He had drawn into himself after his father died and spent many nights crying himself to sleep. That summer I became a substitute father, and it seemed to pay off. He's just fine now; time does wonders to heal such things."

"That's true," his friend answered. "Is that the whole story, or is there more to it?" he continued. "You still didn't say, was he really your next-door neighbor?"

George didn't answer for a moment or two. Then, in a soft voice he said, "No, Eddie is my little brother." ★

QUICKSTOPPERS

CELEBRATING 35 YEARS OF *TMF:* 1954 - 1989

SLICK STUFF

(February 1974)

While the effects of hydroplaning have been well publicized throughout the aviation world, another type of skidding, which can be just as hazardous, probably hasn't been given its fair share of notice.

It's called viscous skidding, and ideal conditions for it are heavy rubber deposits on the runway, light rain following a dry period, and a pilot unaware of its existence.

No doubt there are many pilots who have experienced the phenomenon to some degree without actually being aware of just what was causing them to skid.

What happens is this: water fills the pores of the runway texture and acts as a lubricant between the rubber deposits on the runway and the tire, creating a surface more like freshly waxed linoleum than a runway. When tire loads are introduced through braking or skidding, the thin film of water is turned into trapped steam beneath the tire. The steam breaks down the rubber cure in both the tire and the rubber deposits, creating a near perfect seal. This trapped steam pressure causes the tire to rise off the pavement and, hence, the skidding.

Once this occurs, the skidding may continue onto a clean runway surface since the tire surface itself has been transformed into a lubricant.

So watch out for viscous skidding. Remember, heavy rubber deposits predominate at the ends of the runway. And that's where you'll either be touching down or completing your landing roll.

RUDDER PEDAL OR BRAKE?

(June 1974)

During a C-130 pilot proficiency check, the flight examiner retarded the throttle on Number 1 engine to simulate engine failure. The pilot accomplished all emergency procedures and flew a three engine pattern to touchdown. But a loud "pop" sounded as the pilot reversed Number 2. As the aircraft slowed down on the runway, the pilots felt a vibration and suspected a blowr tire. Their suspicions were confirmed. Both left main tires blew out during a smooth landing. But why? Runway skid marks indicated that both left brakes were locked at touchdown, yet investigators found no malfunction in the brake or hydraulic systems.

Further investigation centered on the possibility of inadvertent brake application as the pilot depressed left rudder to counteract yaw during the flare.

The moral here is "heels on the floor" before and during touchdown.

CPI VS 44 MAGNUM

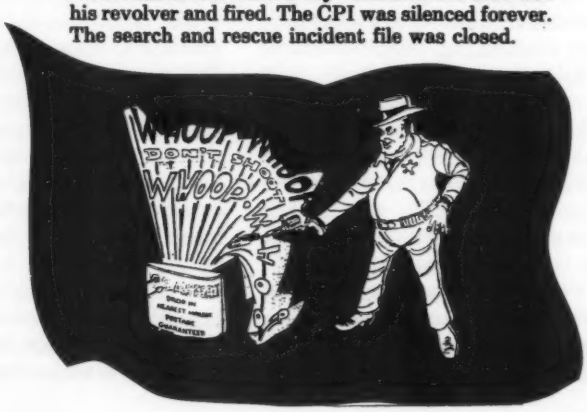
(November 1976)

A red light in the cockpit of the C-130 alerted the crew that the aircraft's CPI had deployed. The familiar beeping tone on Guard confirmed the nagging red light.

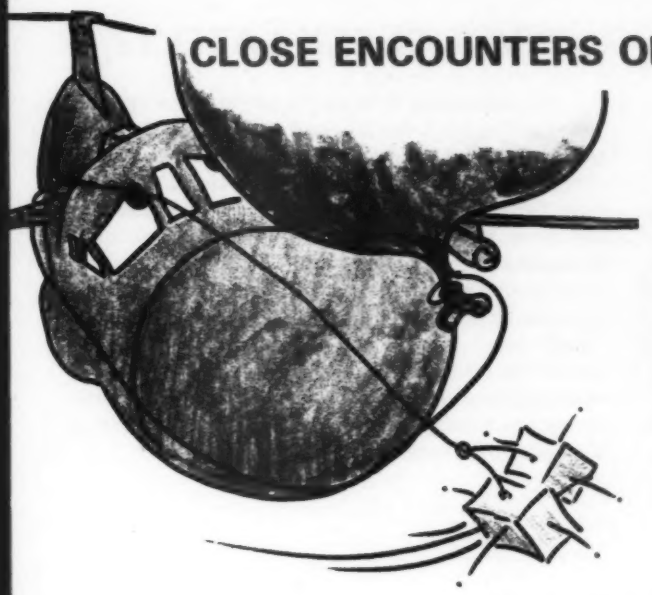
Although the pilot reported the CPI deployment over the Gulf of Mexico, the instrument fluttered inland and came to rest on Texas soil. Other pilots began reporting its persistent tone to the RCC in New Orleans.

The Coast Guard Rescue Coordination Center directed the launch of an HU-16 Albatross to investigate the signal. The Coast Guard crew homed in on the noisy nuisance and directed the local sheriff to the field where the CPI had landed.

The sheriff found it; the HU-16 pilot reported that the distress signal was still crying "wolf." But try as he might, the sheriff couldn't silence the CPI, so . . . he decided to try the same method used against rattlesnakes and other noisy varmints. He drew out his revolver and fired. The CPI was silenced forever. The search and rescue incident file was closed.



CLOSE ENCOUNTERS OF THE BALLOON KIND



Cruising serenely across the south of France at FL 200, some intrepid aviators spotted a 10-foot diameter balloon sharing their airspace. What made the crew think twice about the sight was the 100-foot cable hanging below the balloon, holding several small packages. A quick call to ATC found they were unaware of the balloon. What the crew saw was an unmanned, free-flying meteorological balloon that didn't exceed the weight and size limits listed in ICAO regulations. What *are* the limits you ask? Combined payload of 8.8 pounds for two or more packages, or a single 6.6-pound package, or a payload suspension release requiring 230 Newtons or more to release. (A Newton is a measure of force: a kilogram-meter per second per second. Got that?) Do *you* consider such balloons hazardous to aviation?

HOT FOOT HERK

What began as a pilot proficiency sortie, ended with a fire department response. After making a maximum effort stop for the first landing, the IP candidate next demonstrated a windmill taxi start, slowing the aircraft using steady brake application. Fearing hot brakes, the IP used reverse thrust to control taxi speed during the taxi back for takeoff. Just 10 minutes later, the Herk was airborne again for a closed pattern with the gear extended to cool the brakes. After completing a touch and go, tower reported the aircraft was trailing smoke. A while later the Herk landed with one blown tire, two heat-damaged brakes, extensive damage to the main gear well, and a lot of damaged pride.

QUICKSTOPPERS

PRICE CHECK LATELY?

A C-5 climbing through FL 260 lost the right air conditioning pack due to a bad overheat switch, and the remaining pack wouldn't hold cabin altitude. As cabin altitude reached 10,000 feet, the flight deck crew donned their oxygen masks. A loadmaster in the crew relief compartment notified remaining crewmembers, not on interphone, to don their masks, then donned a portable oxygen mask himself. A few seconds later cabin altitude reached 13,800 feet. About four minutes later another crewmember noticed the loadmaster's face looking very pale. After switching to another O_2 mask, his hypoxia symptoms cleared up. Later, they found a small hole when they inspected the mask hose.

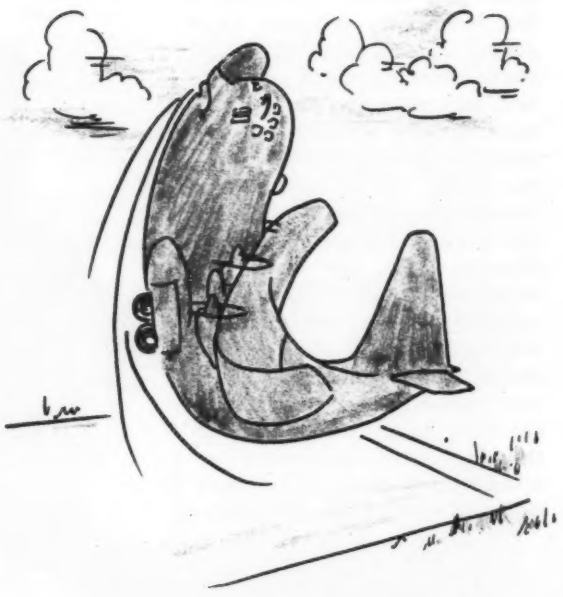
CREW REVELS IN SHORT-CIRCUITED, SHORT-TAKEOFF!

As the Herc crew released brakes, little did they realize they were to become passengers during the ensuing takeoff. Yet, with a posted takeoff speed of 114 knots, the C-130 rotated and flew off the ground at 110 knots. Long about 400 ft MSL, the pilot discovered he had "runaway trim."

Emergency procedures were attempted but failed, so he entered a VFR pattern using 50 percent flaps. A safe landing was made—a credit to their professional crewmanship.

Upon removing the elevator trim access panel, (now get this) an estimated *30 GALLONS* of water drained out! The waterline inside the beavertail was above the base of the elevator trim motor. The water most probably caused an electrical short in the trim motor, which in turn caused the runaway. The drain hole was blocked by debris.

Another point to ponder is that an estimated 240 pounds of water moved the center of gravity 1 percent further aft thanthe loadmaster's figures. A potentially dangerous situation stacked upon a potentially hazardous elevator trim failure.



After Deadlines

GEN. DUANE H. CASSIDY PRESENTS THE BENJAMIN D. FOULOIS MEMORIAL AWARD to a group of folks representing various facets of the Military Airlift Command mission. MAC received the award in recognition of the *"most effective flight mishap prevention program of all major commands in 1988."* The Command operates 1,006 aircraft of 26 types and models. In virtually every part of the globe, MAC people carried out an incredible variety of missions: strategic and tactical airlift; rescue; special operations; aeromedical airlift; Presidential support; weather reconnaissance; operations support airlift; global weather data collection, analysis, and reporting, etc.,--all with remarkably safe operations resulting in a zero Class A and B Flight Mishap rate. Quite an impressive achievement considering it moved more than 340,000 tons of cargo and 1,556,700 passengers. Twenty-Third Air Force' Aerospace Rescue and Recovery Service was credited with saving over 900 lives while the command aeromedical evacuation system airlifted nearly 79,000 patients to hospitals for medical treatment. MAC aircraft airlifted tons of supplies and equipment in support of humanitarian relief around the globe, and participated in over 80 JCS-directed and coordinated exercises. MAC airplanes had an average worldwide maintenance reliability of over 88 percent during 95,492 departures. This high reliability rate was achieved despite the command's heavy flight workload, which in FY 1988 totaled over 670,000 mishap-free hours. ***WELL DONE, MAC.***

Left to Right: Sgt. Randy L. Lawson, 375 CAMS (Jet Mechanic); Capt. Matthew Berry, 443 MAW (C-141 (FEAC); Brig. Gen. Floyd E. Hargrove, MAC IG; SSgt. Sharon A. Dickman, 375 CAMS (Crew Chief); Col. Thomas M. James, MAC Director of Safety; Sgt. Shane Lowry, 57 AES (Flight Med Tech); Lt. Col. James P. Allan, 443 MAW (C-5 FEAC); TSgt. D. J. Schaefer, 443 MAW (C-5 FE); 1st Lt. Linda K. Warren, 11 AAS (C-9 Copilot); Gen. Duane H. Cassidy, CINCMAC; Sgt. Roland G. Ivy, 375 CAMS (Crew Chief); Maj. Todd Howe, 11 AAS (C-9 AC); Capt. Steven Fisher, 62 TAS (C-130 Navigator); and SSgt. Jerry R. Minton, 375 CAMS, (Structural Repair Technician).

☆ U.S. Government Printing Office: 1989 - 654-015/9

TOUCH N GO

JAWS XXI! ! ! Just when you thought it was safe to go back on the ramp . . .